



“Very High Emissions” Scenario: Plausibility of Modeled Outcomes

The Staff Working Group (SWG) has conducted a “Very High Emissions” (VHE) scenario to address some stakeholder concerns about certain key assumptions, including natural gas prices and renewable energy generator builds. This explanation is provided as context for the VHE scenario.

It should be noted at the outset that the VHE runs should be considered outer bound, very worst case scenarios. The VHE scenario represents an unlikely market outcome, because key assumptions behind these runs are very unlikely, especially in combination. Key assumptions for these runs include the following:

- Sustained \$11/MMBtu Henry Hub natural gas price throughout the analysis time horizon;
- Unlimited coal builds allowed in RGGI;
- Artificial limit placed on renewables builds such that only 50% of Renewable Portfolio Standard (RPS) targets are met, and no more; and
- Inability to build new renewable energy capacity on an economic basis.

Projected New Coal Builds

The majority of the increase in projected RGGI cost impact in the VHE scenarios is due to new coal builds in the RGGI region under the VHE reference case. The VHE reference case projects approximately 18,000 MW of new coal-fired generation capacity will be constructed in the nine-state RGGI region by 2012, equivalent to 18 large coal-fired power stations. This increase in new coal capacity dramatically increases reference case CO₂ emissions, resulting in significantly higher CO₂ emissions reductions needed to meet the RGGI cap and therefore significantly higher RGGI allowance prices.

- Current planned new coal capacity totals 77,000 MW nationally, a significant portion of which is likely to never be built, due to the speculative nature of new power plant proposals and the “boom and bust” cycles of the power generation market.
- Current planned new coal capacity in the nine-state RGGI region totals 40 MW, just 0.0005% of new capacity proposed nationally.

Natural Gas Price Projection

It is unlikely that natural gas prices of \$11/MMBtu are sustainable over the next 20 years. Energy and Environmental Analysis, Inc., estimates that stranded global natural gas reserves total between 3,000 Tcf and 5,000 Tcf, equivalent to more than 150 years of current annual U.S. consumption. Sustained high gas prices should create a further incentive to bring this gas to market through LNG imports.

- It is highly unlikely that the natural gas market would fail to react to sustained market prices in the \$11/MMBtu range by increasing natural gas supply. Most long-term natural gas price forecasts project a significant increase in LNG imports.
- Current NYMEX long-term futures (2007-2009) for natural gas are below \$11/MMBtu. The average annual price for 2007 futures is \$9.65/MMBtu, dropping to an annual average of \$7.64/MMBtu for 2009 futures.
- The market is already responding to higher prices by increasing LNG import capacity.
 - Two of the four existing LNG terminals in the U.S. were brought back on-line in recent years in response to higher prices. Planned expansion at three of these four existing terminals through 2008 would nearly double existing U.S. LNG import capacity.
 - Forty (40) LNG import terminals are proposed for North America. Six of these proposed terminals would be located in the Northeast and Mid-Atlantic, and two would be located in New Brunswick and Nova Scotia. FERC has already approved applications for 12 LNG terminals.
- The rapid growth of the global LNG market is witnessed by expansion of the LNG tanker fleet. As of October 2003, there were 151 tankers in the LNG fleet, with 55 under construction. Completion of these new tankers will increase the capacity of the fleet by 44%, from 366 Bcf of natural gas equivalent in 2003 to 527 Bcf of natural gas equivalent by 2006.

Renewable Energy

Sustained high natural gas prices should increase the likelihood that RPS targets would be met and exceeded, since renewable energy builds would become economic due to a significant increase in wholesale power price. The

VHE scenario ignores market fundamentals by disallowing new economic renewable energy capacity in a market situation that would drive such construction, especially in scenarios where a carbon constraint is also in place.

- The “high emissions” scenario, which included a \$7.00/MMBtu sustained natural gas price, resulted in 3,000 MW of economic new renewable energy capacity in the nine-state RGGI region (beyond that required under the RPS).
- A sustained natural gas price of \$11/MMBtu should be expected to result in an even higher market penetration for renewable energy, thereby moderating the increase in CO₂ emissions.
- Concern has been raised that the modeled penetration of new wind facilities may be overly optimistic due to local opposition and siting difficulties.
 - Reference case assumptions for renewable energy already include significant derating of potential wind resource availability to account for permitting difficulty, as a proxy for local opposition to the siting and construction of new renewable energy facilities.

Demand Response

Electricity demand in all RGGI IPM runs is based on 2004 ISO load forecasts conducted prior to the recent increase in natural gas prices. None of the RGGI IPM model runs include a demand response function that would allow end-use markets to respond to significant increases in fuel and electricity prices. It is likely that sustained high gas prices in the \$11/MMBtu range would result in a demand response in both natural gas and electricity end-use, due to both an increase in end-use energy efficiency and conservation. This demand response would be expected to moderate both natural gas and electricity prices over time, as well as moderating reference case CO₂ emissions.

Sources

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